

**UPDATE:**  
**The ICJIS Implementation of XML**  
**and the**  
**Global Justice XML Data Model**  
**(GJXDM)**

(April 15, 2005)



## ***Integrated Criminal Justice Information Systems Maricopa County, Arizona***



### **ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

#### **OBJECTIVE:**

The Global Justice XML Data Model (GJXDM) has been identified as a fundamental component in the building of data exchanges by the Integrated Criminal Justice Information Systems (ICJIS) and other Maricopa County Justice and Law Enforcement Agencies. This report provides an update on how ICJIS has been incorporating XML, specifically, the GJXDM into justice data exchanges.

#### **INTRODUCTION:**

For many years, the ability of federal, state, tribal and local agencies to share justice information has been limited due to diverse computer systems and data structures. With the advent of XML (Extensible Markup Language), there is now a way to define a standard vocabulary and a standard structure which can be used by everyone without making changes to the underlying systems.

XML was designed to describe data with precise text labels so that information can be sent from one agency to another and be easily understood. XML not only clearly describes the names of the data being exchanged, but the format as well providing much greater control over data quality.

XML is easily transmitted and vendors of major databases and applications are increasing functionality to assist in the development and use of XML. Since XML is independent of the various technologies (databases, programming languages, etc.) used by the agencies, everyone can send and receive data in this common fashion.

In the justice world, the U.S. Department of Justice (DOJ) funded the development of the Global Justice XML Data Model (GJXDM). The vision for the GJXDM is "to significantly advance justice information sharing by providing a common language and vocabulary that reduces cost and technical barriers."<sup>1</sup> More and more of the justice community is either currently using or is planning on using the GJXDM to expedite information sharing as it provides an XML framework as well as standard naming conventions and definitions for justice related information.

---

<sup>1</sup> "The Development of the Global Justice XML Data Model" presentation by Paul Embley and Robin Gibson of the Global XML Task Force, [http://justicexml.gtri.gatech.edu/workshop/Day1/1\\_BackgroundHistory.pdf](http://justicexml.gtri.gatech.edu/workshop/Day1/1_BackgroundHistory.pdf)



***Integrated Criminal Justice Information Systems  
Maricopa County, Arizona***



**ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

In February 2005, the U.S. Department of Justice (DOJ) issued a report called “The National Criminal Intelligence Sharing Plan”.<sup>2</sup> In this report, the DOJ stated that:

“Agencies are encouraged to utilize the latest version of the Global Justice Extensible Markup Language (XML) Data Model (Global JXDM) and its component Global Justice XML Data Dictionary (JXDD) when connecting databases and other resources to communication networks. The Global JXDM and Global JXDD were developed to enable interoperability through the exchange of data across a broad range of disparate information systems.”

The Second Quarter 2005 issue of DOJ's “Global News”<sup>3</sup> reported that the DOJ has formed a partnership with the Department of Homeland Security (DHS) to build an enhanced version of the GJXDM called the National Information Exchange Model (NIEM). This objective to expand the GJXDM will facilitate effective information sharing for the entire justice and public safety community. It was also recognized that the long term stability of the GJXDM must be promoted and the work of the early adaptors of the GJXDM protected. This collaboration provides a clear and consistent direction for increasing the sharing of information among justice agencies.

---

<sup>2</sup> “The National Criminal Intelligence Sharing Plan” [http://www.it.ojp.gov/documents/NCISP\\_Plan.pdf](http://www.it.ojp.gov/documents/NCISP_Plan.pdf)

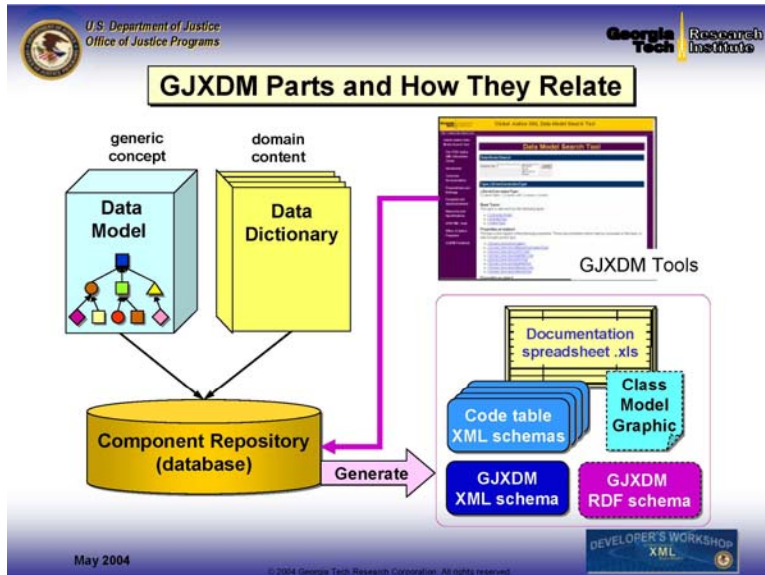
<sup>3</sup> [http://www.it.ojp.gov/documents/2005\\_2ndqtr\\_global\\_news.pdf](http://www.it.ojp.gov/documents/2005_2ndqtr_global_news.pdf)



## ***Integrated Criminal Justice Information Systems Maricopa County, Arizona***



### **ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**



#### **Background on the GJXDM:**

The GJXDM was built using widely accepted industry standards and models. It involves three major components:

- an object-oriented data model,
- a data dictionary
- an XML schema specification.

The data model and dictionary are parts of the common "vocabulary" used by different computer systems to describe data objects to be shared. Using these standardized definitions within the XML structure provided by the GJXDM schema, software scripts translate information as it passes from one system to another.

The Justice Data Dictionary (JXDD 3.0) is the foundation of the Global Justice XML Data Model (GJXDM). It was compiled from approximately 35 data dictionaries and various other XML documents that were under development or in use in the justice communities. The standardized data objects were chosen by representatives from the agencies and industry partners who have been working together since March 2001. The group, known as the Global Justice Information Sharing Initiative, identified approximately 2,500 common data objects after reviewing more than 20,000 candidate objects, many of which were redundant.

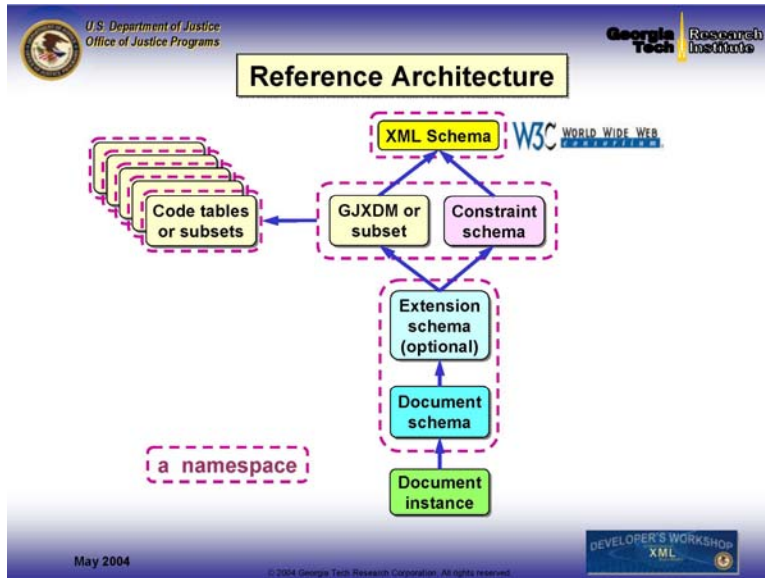
The GJXDM contains a large majority of the common elements used within the justice community today. This current set of data in the GJXDM will be enhanced and expanded as more agencies begin using it. Mechanisms are in place to receive suggestions for new data elements, improved definitions, new data relationships and structures within the schema, etc. As well, a versioning process is also in place which protects work done using earlier releases.



## ***Integrated Criminal Justice Information Systems Maricopa County, Arizona***



### **ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**



### **Reference Architecture**

GJXDM developers also provided a Reference Architecture to ensure consistency in the use of the GJXDM schema, while providing flexibility for inevitable extensions to meet individual agency needs. In May 2004, the developers rolled out online tools which greatly facilitate the use of the GJXDM.

The official release of the GJXDM 3.0 occurred in January 2004. What began in 2001 is now being used or in the process of being implemented at the Federal level and at many State and local agencies across the country. This includes use by the FBI (for the III Rap Sheet) and the Arizona Department of Public Safety (for Arrest Capture and Disposition exchanges).

### **GJXDM Efforts Underway**

The Second Quarter 2005 issue of DOJ's "Global News"<sup>4</sup> reported that "over 50 justice information sharing projects are utilizing the Global JXDM to revolutionize the justice system." In addition to local efforts, such as those happening in Maricopa County, these projects include:

- **AMBER Alert** –(<http://www.ojp.gov/amberalert/>)
- **NLETS – Interstate Messages & Driver Status and History** (<http://www.nlets.org/>)
- **FBI Rap Sheet** (Joint Task Force - JTF members include FBI, NLETS, SEARCH)
- **OXCI** -Open XML Court Interface for electronic filing of court documents (<http://oxci.sourceforge.net>)
- **Arizona Criminal Justice Commission** - preparing disposition, citation and sentence schemas.
- **AZ DPS** is using GJXDM schemas for Arrest Capture and Disposition Tracking information.
- **OASIS** - coordinating a national effort to develop reference schemas for common justice documents, such as a Court Disposition, Sentence, Citation and Adult Protection Order.

<sup>4</sup> [http://www.it.ojp.gov/documents/2005\\_2ndqtr\\_global\\_news.pdf](http://www.it.ojp.gov/documents/2005_2ndqtr_global_news.pdf)



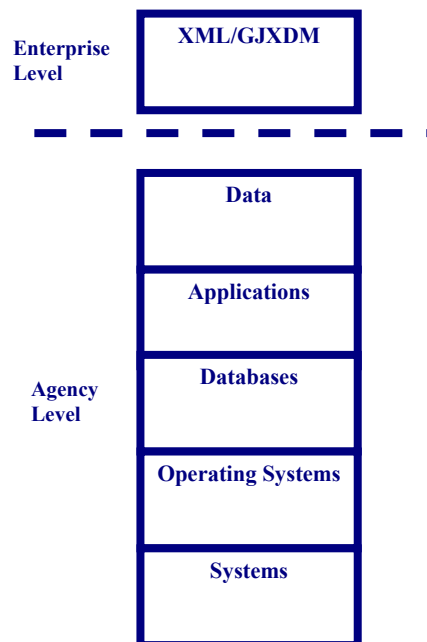
**ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

**The GJXDM and ICJIS**

ICJIS has been involved with the Global Justice XML Data Model (GJXDM) since the initial efforts to build the first Justice Data Dictionary. The ICJIS Common Data Dictionary was one contribution to that project. Once the GJXDM was officially released in the first quarter of 2004, ICJIS began to investigate whether to incorporate this into the justice data exchange work being done within Maricopa County. It became obvious that the GJXDM was about to be rapidly adopted across the country, ushering in the use of XML along with the common justice language found in the JXDM.

By using the GJXDM early on, ICJIS could position Maricopa County for the future, as well as provide leadership in this area at the County, State and National levels. Some of the immediate benefits derived from sharing data using current XML technology and the GJXDM include:

- Data quality and consistency is improved by using GJXDM schemas with well defined constraints and sets of valid values.
- Agency ownership of data is maintained, yet data is easily shared by utilizing the common language and vocabulary provided by the GJXDM.
- Costly and time consuming changes to underlying systems and databases are avoided, since everyone can use the common XML basis of the GJXDM.





## ***Integrated Criminal Justice Information Systems Maricopa County, Arizona***



### **ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

- Increased reuse of commonly defined and structured data (that is, GJXDM based XML schemas) reducing the need of unique solutions for data exchanges.
- Addressing the Maricopa County Board of Supervisors' expressed interest for ICJIS and the justice agencies to be able to share information among themselves and with outside jurisdictions at the local, state and national levels.
- Positioning the County to advance with emerging technologies such SOA - Service Oriented Architectures.
- Providing State and National leadership in the creation of reference XML schemas based on the GJXDM for justice and law enforcement documents, such as Court Disposition, Sentence Order, Arrest Capture and Booking.

### **Using the GJXDM – ROI vs Implementation Costs**

The primary investment for implementing data exchanges based on the GJXDM involves training costs. As with any new technology, it is important to keep technology staff up to speed. Training in understanding XML and its related technologies (transformations, parsing, validation, etc.) is the biggest need for the Justice and Law Enforcement Agencies. ICJIS has already made the investment to understand the GJXDM and how to build schemas utilizing it. The Agencies will need to know how to create and consume XML data files based on those XML schemas. Many of the tools and databases already in use have or are incorporating features to handle XML, facilitating the use of this technology. And since the GJXDM provides a common vocabulary, Agencies should begin to see reuse in their code as similar sets of data with the same XML names are used over and over in the sharing of more and more information.

Since much of the justice grant funding is now being conditioned upon the requirement that technical solutions utilize the GJXDM, this training investment is becoming a necessity. For example:

(1) An Office of Justice Programs (OJP) document dated June 8, 2004 included the following Grantee Guidelines:

“To support public safety and justice information sharing, OJP requires the grantee to use the Global JXDM specifications and guidelines for this particular grant. Grantee shall publish and make available without restriction all schemas (extensions, constraint, Proxy) generated as a



***Integrated Criminal Justice Information Systems  
Maricopa County, Arizona***



**ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

result of this grant to the component registry as specified in the guidelines. This information is available at [www.it.ojp.gov/gjxdm](http://www.it.ojp.gov/gjxdm).<sup>5</sup>

(2) The Arizona Criminal Justice Commission (ACJC) has said that “The GJXDM was adopted by the Commission and the requirement to move to it is included in the grant agreements agencies get when they obtain grant funds from ACJC” (per Gerald.Hardt, Program Manager, ACJC).

(3) AZ Supreme Court – In January 2004, the Technical Advisory Committee for the Commission on Technology (COT) proposed new standards which included the GJXDM for building new systems. This was adopted by the COT to be effective in 24 months.<sup>6</sup>

The Return on Investment by embracing the GJXDM will be seen in:

- Faster development time as more agencies use and become familiar with the standard GJXDM tags and schema since reuse will increase over time.
- Keeping data exchange development costs down by using commonly accepted XML tags and structure (i.e. GJXDM) instead of proprietary vendor code.
- Improved data quality as more data validations are documented in and verified by schemas.
- Reduced system maintenance costs as data and format changes are managed at the XML level which is independent of the underlying technologies within agencies.
- Expedited schema development by leveraging GJXDM work completed by other jurisdictions.
- Improved public safety as the result of dynamic criminal history data access and collection and succinct presentation of this information to judicial officials.

<sup>5</sup> [http://www.it.ojp.gov/documents/20040607\\_GISWG\\_meeting\\_summary.pdf](http://www.it.ojp.gov/documents/20040607_GISWG_meeting_summary.pdf)

<sup>6</sup> <http://www.supreme.state.az.us/cot/Archives/FY04/040109/min040109a.pdf>



## ***Integrated Criminal Justice Information Systems Maricopa County, Arizona***



### **ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

#### **ICJIS Goals and Objectives for Adopting the GJXDM**

As stated earlier, ICJIS began to work with the GJXDM in early 2004. However, it was in May of this year that the effort took off as the Office of Justice Programs (OJP) provided both training and tools which greatly facilitated using the GJXDM. ICJIS plans on keeping Maricopa County moving in this direction by:

- Implementing data exchanges with XML and schemas which are in compliance with GJXDM without impact to deliverable schedules.
- Building XML schemas which reflect a balance of conformity with the GJXDM, efficiency and reusability.
- Providing leadership to promote the use of the GJXDM as the means for sharing information among justice agencies both inside and outside of Maricopa County.
- Maximizing the use of open source tools for building and using XML schemas and transactions.
- Evolving to a GJXDM/JXDD compatible data dictionary.
- Reducing enterprise costs to modify information exchanges through common GJXDM transformations.

#### **ICJIS GJXDM Rollout Plan:**

In order to accomplish the goals laid out above, ICJIS will:

- Update the ICJIS Convergent Architecture to include XML and specifically promote building exchanges which are consistent with the GJXDM.  
(See EXHIBIT A – ICJIS XML to GJXDM Progression).
- Begin designing GJXDM consistent schemas for all data exchanges, at all levels, to the extent of not impacting project schedules.
- Assist other Maricopa County justice and law enforcement agencies' efforts to use the GJXDM.
- Brief JALET and the Business Team on the ICJIS GJXDM strategy and rollout to gain their understanding and support.



## ***Integrated Criminal Justice Information Systems Maricopa County, Arizona***



### **ICJIS Implementation of XML and the Global Justice XML Data Model (GJXDM)**

- Continue dialogue, training, development and interaction with national and local justice organizations' efforts regarding the GJXDM, including the OJP performance testing of the GJXDM.
- Network with other GJXDM implementers to explore best practices.
- Participate in State and National events which promote the use of the GJXDM.
- Utilize the tools (JXDD Spreadsheet, online Data Model Viewer and Subset Schema Generator) and processes (Reference Architecture, Data Naming Convention, Namespace standards, etc) recommended by GJXDM designers.
- Explore developing reusable GJXDM extension and sub-schemas and a county registry and resource URL for posting schemas and related information.
- Develop best practices documentation.
- Utilize middleware where possible to perform transformations between schemas to further promote standardization without local impact.
- Develop GJXDM schemas for Common Code Tables to increase data consistency.
- Work with ACJC XML Committee in providing GJXDM education, best practices, reference schemas, etc.

### **Where is there more Information on the GJXDM?**

The Office of Justice Programs (OJP) web site: <http://www.it.ojp.gov/> contains links for:

- Downloading the latest jxdm.xsd and related spreadsheet
- The GJXDM tools
  - GJXDM Data Model Viewer
  - GJXDM Schema Subset Tool
- GJXDM Implementation Guidelines
- GJXDM Developer's Workshop Training Materials

Additionally, one can join the JXDM ListServ, which is an excellent way to see what others are asking about the GJXDM and allows you to pose your own questions. Other links can help research who is using the GJXDM, offer background and supporting information on both the GJXDM and XML, identify future training events and provide more contact information.

# ICJIS XML to GJXDM Progression

